

AMENDED CLAIMS

What is claimed is:

1. (currently amended) A valve base module, comprising:
a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;
a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and
a tank core passage connecting at least some of said chambers, said tank core passage extending ~~through within a non-vertical plane defined by containing~~ said longitudinal axis and a ~~non-vertical cross-section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold.~~
2. (currently amended) The valve base module of Claim 1, wherein said ~~non-vertical~~ plane is disposed at an offset angle α relative to a ~~vertical~~ second plane ~~defined by containing~~ said longitudinal axis and a ~~vertical cross-section extending through said valve housing, said~~ second plane oriented perpendicular to said surface.
3. (currently amended) The valve base module of Claim 2, wherein said ~~non-vertical~~ plane is substantially perpendicular to said ~~vertical~~ second plane.
4. (currently amended) The valve base module of Claim 2, wherein said ~~non-vertical~~ plane is perpendicular to said ~~vertical~~ second plane.
5. (original) The valve base module of Claim 2, wherein said offset angle α satisfies a relation $0 < \alpha < 360^\circ$.
6. (original) The valve base module of Claim 2, wherein said offset angle α satisfies a relation $\alpha \approx 90^\circ$.

7. (original) The valve base module of Claim 2, wherein said offset angle α satisfies a relation $\alpha = 90^\circ$.

8. (currently amended) The valve base module of Claim 2, wherein said offset angle α permits one or more of at least said P, T, A, and B ports to connect a ~~bottom~~ first surface of said valve housing to ~~a top~~ an opposing second surface of said valve housing.

9. (currently amended) The valve base module of Claim 2, wherein said offset angle α permits one or more of at least said P, T, A, and B ports to connect a ~~bottom~~ first surface of said valve housing to ~~a top~~ an opposing second surface of said valve housing to form one or more of at least P', T', A', and B' ports.

10. (currently amended) The valve base module of Claim 2, wherein said offset angle α permits one or more of at least said P, T, A, and B ports to connect a ~~bottom~~ first surface of said valve housing to ~~a top~~ an opposing second surface of said valve housing to form one or more of at least P', T', A', and B' ports that permit one or more additional modules to be mounted thereon thereto.

11. (currently amended) The valve base module of Claim 2, wherein said offset angle α permits one or more of at least said P, T, A, and B ports to connect a ~~bottom~~ first surface of said valve housing to ~~a top~~ an opposing second surface of said valve housing to form one or more of at least P', T', A', and B' ports that permit one or more additional modules to be mounted thereon thereto, wherein said ~~bottom~~ first surface conforms to a standard mounting pattern.

12. (original) The valve base module of Claim 1, wherein said valve element is moveable within said longitudinal bore.

13. (original) The valve base module of Claim 1, further comprising means for moving said valve element within said longitudinal bore.

14. (currently amended) The valve base module of Claim 13, wherein said means for moving said valve element comprise means selected from ~~the~~ a group consisting of manual means, mechanical means, electrical means, magnetic means, hydraulic means, and pneumatic means.

15. (original) The valve base module of Claim 1, wherein said valve base module operates as a two-way, three-way, or four-way valve.

16. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending ~~through~~ within a non-vertical plane defined by containing said longitudinal axis and a non-vertical cross-section ~~extending through~~ said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold; and

ii) a pilot control module in communication with said valve base module, said pilot control module configured to be able to move said valve element within said longitudinal bore.

17. (original) The modular valve system of Claim 16, wherein said pilot control module contains a pilot control valve assembly.

18. (original) The modular valve system of Claim 17, wherein said pilot control valve assembly is an integrated component of said pilot control module.

19. (original) The modular valve system of Claim 16, wherein said pilot control valve assembly is configured to actuate said pilot control module in on-off operation.

20. (original) The modular valve system of Claim 16, wherein said pilot control valve assembly is configured to actuate said pilot control module in proportional operation.

21. (original) The modular valve system of Claim 16, wherein said pilot control valve assembly is configured to actuate said pilot control module in servo operation.

22. (original) The modular valve system of Claim 16, wherein said pilot control valve assembly is configured to actuate said pilot control module in at least more than one of on-off operation, proportional operation, and servo operation.

23. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending through within a non-vertical plane defined by containing said longitudinal axis and a non-vertical cross-section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold;

ii) a pilot control module in communication with said valve base module, said pilot control module configured to move said valve element within said longitudinal bore; and

iii) a power supply module in communication with said pilot control module, said power supply module configured to operate said pilot control module.

24. (currently amended) The module modular valve system of Claim 23, wherein said power supply module is a low power device.

25. (currently amended) The ~~module~~ modular valve system of Claim 23, wherein said power supply module accepts universal inputs.

26. (currently amended) The ~~module~~ modular valve system of Claim 25, wherein said universal inputs include at least one or more of a 12 volt DC input, 24 volt DC input, 48 volt DC input, 120 volt AC input, 250 volt AC input, 460 volt AC input, 50 Hertz input, and 60 Hertz input.

27. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending ~~through within a non-vertical plane defined by containing~~ said longitudinal axis and a ~~non-vertical cross section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold;~~

ii) a pilot control module in communication with said valve base module, said pilot control module configured to move said valve element within said longitudinal bore;

iii) a power supply module in communication with said pilot control module, said power supply module configured to operate said pilot control module; and

iv) a thermally insulating module to thermally isolate said pilot control module from said power supply module.

28. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending ~~through within a non-vertical plane defined by containing~~ said longitudinal axis and a ~~non-vertical cross-section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold~~; and

ii) a pressure reducing module in communication with said valve base module, said pressure reducing module configured to be able to reduce pressure to said valve base module.

29. (original) The modular valve system of Claim 28, wherein said pressure reducing module contains a pressure reducing valve cartridge.

30. (original) The modular valve system of Claim 29, wherein said pressure reducing valve cartridge is an integrated component of said pressure reducing module.

31. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending through within a non-vertical plane defined by containing said longitudinal axis and a non-vertical cross-section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold;

ii) a diagnostic module in communication with said valve base module, said diagnostic module configured to be able to communicate data about said valve base module.

32. (currently amended) The modular valve system of Claim 31, wherein said diagnostic module contains a shuttle valve assembly.

33. (currently amended) The modular valve system of Claim 32, wherein said shuttle valve assembly is an integrated component of said diagnostic module.

34. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending through within a non-vertical plane defined by containing said longitudinal axis and a non-vertical cross-section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold; and

ii) a load sense module in communication with said valve base module, said load sense module configured to be able to sense a highest load pressure between at least some of said chambers.

35. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending through within a non-vertical plane defined by containing said longitudinal axis and a non-vertical cross-section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold; and

ii) a position feedback sensor module in communication with said valve base module, said position feedback sensor module configured to be able to sense a position of said valve element within said longitudinal bore.

36. (currently amended) The modular valve system of Claim 35₂ wherein said position feedback sensor module attaches directly to said valve element.

37. (currently amended) A modular valve system, comprising:

i) a valve base module, comprising:

a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;

a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and

a tank core passage connecting at least some of said chambers, said tank core passage extending ~~through within a non-vertical plane defined by containing~~ said longitudinal axis and a ~~non-vertical cross section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold; and~~

ii) a manual override module in communication with said valve base module, said manual override module configured to be able to manually control said valve base module.

38. (currently amended) The modular valve system of Claim 37₂ wherein said manual override module attaches directly to said valve element.

39-42. (cancelled)

43. (currently amended) A valve base module, comprising:
- a valve housing having a longitudinal bore extending about a longitudinal axis of said valve housing;
- a valve element disposed within said longitudinal bore, said valve element having one or more lands that divide said longitudinal bore into a plurality of chambers; and
- means for connecting one or more of at least P, T, A, and B ports from a bottom surface of said valve housing to a top surface of said valve housing, said means comprising a tank core passage connecting at least some of said chambers, said tank core passage extending through within a non-vertical plane defined by containing said longitudinal axis and a non-vertical cross-section extending through said valve housing, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold.
44. (new) The valve base module of Claim 1, wherein said valve base module is of unitary construction.
45. (new) The valve base module of Claim 5, wherein $\alpha \neq 180^\circ$.
46. (new) The valve base module of Claim 1, wherein said surface conforms to a standard mounting pattern.
47. (new) The valve base module of Claim 46, wherein said standard mounting pattern is a DO3 valve pattern or equivalent.
48. (new) The valve base module of Claim 46, wherein said standard mounting pattern is a DO5 valve pattern or equivalent.
49. (new) The valve base module of Claim 46, wherein said standard mounting pattern is a DO8 valve pattern or equivalent.

50. (new) The valve base module of Claim 1, wherein said valve base module is configured for use in industrial markets.

51. (new) The valve base module of Claim 1, wherein said valve base module is configured for use in mobile markets.

52. (new) The valve base module of Claim 1, wherein said tank core passage directly connects said chambers.

53. (new) The valve base module of Claim 1, wherein said valve base module contains a single tank core passage.

54. (new) The valve base module of Claim 1, wherein said valve base module is not directly actuatable by one or more electromagnetic devices.

55. (new) A valve base module, comprising:
a valve housing having a bore extending about an axis of said valve housing;
a valve element disposed within said bore, said valve element having one or more lands that divide said bore into a plurality of chambers; and
a tank core passage connecting at least some of said chambers, said tank core passage extending within a plane containing said axis, said plane oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold.

56. (new) A valve base module, comprising:
- a valve housing having a bore;
- a valve element disposed within said bore, said valve element having one or more lands that divide said bore into a plurality of chambers; and
- a tank core passage connecting at least some of said chambers, said tank core passage extending within a plane that is oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold.
57. (new) A valve base module, comprising:
- a valve housing having one or more chambers disposed about a bore of said housing; and
- a tank core passage connecting one or more of said chambers, said tank core passage extending within a plane that is oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said valve base module to at least one of a sub-plate or bar manifold.
58. (new) A valve housing, comprising:
- one or more chambers disposed about a bore of said housing;
- a tank core passage connecting one or more of said chambers, said tank core passage extending within a plane that is oriented in non-perpendicular relation to a surface of said valve housing comprising at least a P, T, A, and B port and standard mounting holes for mounting said housing to at least one of a sub-plate or bar manifold.

59. (new) A valve base module, comprising a:

A. Housing, comprising:

1. First and second opposing surfaces, the first surface containing:
 - a. P, T, A, and B ports, and
 - b. Standard mounting holes for mounting the module to at least one of a sub-plate or bar manifold,

the first surface defining a first plane;
 2. Third and fourth opposing surfaces each contiguous with the first and second surfaces;
 3. Fifth and sixth opposing surfaces each contiguous with the first, second, third, and fourth surfaces; and
 4. A bore (i) extending along an axis that is intermediate between the first, second, third, and fourth surfaces, and (ii) terminating in at least one of the fifth and sixth surfaces;
- B. Valve element disposed within the bore, the element having at least one land that divides the bore into at least two chambers; and
- C. Tank core passage (i) connecting at least of the two chambers, and (ii) defining a second plane that contains the axis and is either parallel to or intersects at a non-perpendicular angle with the first plane.

60. (new) The valve base module of Claim 59, in which the housing is in the shape of a rectangular box.

61. (new) The valve base module of Claim 59, in which the bore terminates in both in both of the fifth and sixth surfaces.

62. (new) The valve base module of Claim 59, in which the first plane is parallel to the second plane.

63. (new) The valve base module of Claim 59, in which the standard mounting holes are selected from a group consisting of a D03, D05, and D08 valve pattern.